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THE DEVELOPMENT OF THE CENSUS.

The census of the United States furnishes a striking instance of the growth of administrative functions. Originally intended as a simple device for the determination of apportionment, the census has come to be looked upon as a great national balance-sheet on which, from decade to decade, the results of national development are to be recorded and summarized. In exceeding the limits set for it by the letter of the constitution it has not only served real and fancied needs of practical administration, but has become a leading instrument in the scientific investigation of the social and economic conditions of the nation. The preparations which are now being made for the twelfth census have, therefore, more than a practical or political interest. The census operations are eagerly followed by all who are seeking light on the many problems of public policy, whether for the solution of a scientific inquiry or for the attainment of a practical end.

The development of the census from humble beginnings to its present proportions portrays the growth in number and complexity of these problems of national concern. A comparison of the first census of 1790 with that of 1890 shows a truly remarkable growth which can be roughly measured by the amount of expenditure or by the amount of printing involved. While the first census cost the government \$44,377.28, the last, or eleventh census has cost upwards of \$11,000,000. This increase in expenditure has been due in part to the growth of population, but in still larger degree to the extension of the scope of statistical inquiries and the greater elaboration of their results. If the same per capita cost of enumeration had prevailed in 1890 as one hundred years before, the cost of the census

would have fallen short of \$1,000,000. Not only has the enumeration of the population itself become infinitely more detailed, but a large number of inquiries have been added to those relating to the population. The Census Report of 1790, relating to population only, is a thin octavo pamphlet of fifty-six pages, while the Report on Population of the eleventh census is comprised in two quarto volumes aggregating 2181 pages. The entire census of 1890 is to comprise twenty-five quarto volumes, with upwards of twenty-two thousand pages of printed matter, exclusive of the compendium (three volumes), the abstract and the atlas.

In considering the steps by which the census has grown to such proportions our inquiry will be facilitated by considering in the first instance the development of the inquiries relating to population and reserving for subsequent consideration the addition of further inquiries. An obvious reason for such a division of the subject and its treatment by topics lies in the fact that population is the only subject comprised in the enumerations from start to finish.

The history of the enumeration of the people may be conveniently considered in three distinct periods. The first, which is one of wholly primitive methods, closes with the census of 1840. The second, which is marked by an improvement of the schedules, but an adherence to antiquated and ineffective organization, begins with 1850 and ends with 1870. The third period begins with 1880 and includes our experience down to the present time.

First Period, 1790-1840.

Prior to the adoption of the constitution there had been no general numbering of the people in the colonies. From time to time the Board of Trade and Plantations demanded reports from the various governors as to the number of inhabitants in their colonies. Statements prepared in response to such orders constitute our chief material for a

knowledge of population in the colonial period. The figures given rest chiefly on conjecture and estimate, and do not constitute an enumeration in the modern sense.

The census of 1790, taken in accordance with the constitutional provision, directing an enumeration of the people to be made, was not only the first which covered the territory of the United States as a whole, but it was also the first direct enumeration made anywhere.* It needs no explanation to show that the constitutional provision was dictated by no enlightened insight into the value of statistical research but by the practical need of ascertaining the numbers of the people for the purpose of apportionment. The constitutional rule which placed the representation of slaves and free persons on a different basis, involved, however, a distinction between these two classes in the enumeration. The letter of the constitution would have been fully satisfied had no further distinctions been made. Yet the first census law shows that the idea of utilizing the census for other ends than the mere regulation of apportionment had its origin at the outset of our history.

Some features of the law †—at least those relative to the machinery of census-taking—remained in operation for a long time. The act provides that the enumeration of the people shall be made under the direction of the United States marshals, who might appoint as many assistants as might be necessary to accomplish the task. The assistants were required to make the returns by a personal visit to each dwelling-house.‡ All persons over sixteen years of age were

* Histories of statistics frequently ascribe to Sweden the honor of having in 1748 taken the first census. The account of the population prepared at that time was, however, a transcript of the permanent registers of the population which existed in Sweden, and not a direct enumeration.

† Act of March 1, 1790.

‡ In the absence of an adequate supervision of the work of the enumerators, it is to be feared that this provision was not strictly carried out. As late as 1860 it was not infrequent that in the rural regions the census was filled out on court days. The story of the man who took a census in a "boom" region by announcing that he wanted to buy real estate, and counting the crowd which gathered about the hotel, is not wholly improbable.

required to make the returns and give the information prescribed by the act under a penalty of \$20.00 for refusal. The payment to assistants was \$1.00 for every 150 persons enumerated. A curious provision of the law was that before making their return to the marshal the assistants were required to prepare two copies, which were to be posted for the inspection of the public, and in making returns to the marshals they were required to add a certificate from two reputable citizens that the returns had been posted, as the law required. When the returns were received by the marshals they were to be transmitted by them to the President. For their labors the marshals received fixed sums expressly stated in the law, varying from \$100 to \$500. The law requires returns on the points included in the following scheme:*

NAME OF HEAD OF FAMILY.	IN EACH FAMILY THE NUMBER OF					
	FREE WHITES.			Other free persons.	Slaves.	All persons.
	Males of sixteen years and over.	Males under sixteen years.	Females.			
1	2	3	4	5	6	7
.....

The schedule contained one line for each family. When it was completed a new one was commenced. It is to be inferred that the locality was indicated at the top of the sheet, as there is no column for these notices as in later census schedules. It will be observed that the letter of the constitutional requirement would have been fulfilled if columns 2 to 5 of the above scheme had been united in one. We have no express record of the purpose in making these

* This is not an exact reproduction of the schedule used, but indicates its form and essential nature.

distinctions, but it is evident to students of statistics that the division of the free white males into age classes was dictated by considerations respecting possible military strength.

The census returns of 1790 were issued in the following year in an edition of 150 copies, all of them signed by Jefferson, Secretary of State. A table of returns by states, on the first page, represents the only work which was done by the central authority. Technically even this is defective, since the individual columns are not added, but only the final column, which gives the totals for each state. The remainder of the scanty volume is devoted to the returns of the marshals, which are printed in exactly the form in which they were made by those officials. With a schedule such as has been described there is little possibility of other than a geographical grouping of facts. In the northern states as a rule town or township population is given, as well as that of the counties, although Connecticut, which had a township organization, is returned by counties only. In the southern states, where the county was the unit of local organization, we find no further sub-division of the returns. Simple as the schedule was, the marshals found it possible to vary the reports. Thus the Massachusetts marshal gives the names of his assistants, indicating the districts to which they were assigned and the total number of persons returned by each enumerator. In Virginia each assistant had a county and his name appears in the report. In general the returns are simply a summary of the categories mentioned in the schedule. It is, however, of interest to note that the Massachusetts marshal goes beyond the instructions, adding columns giving the number of houses and the number of families, while in New York the marshal has analyzed the figures by ascertaining and reporting for each town the excess of males and the excess of females. Of course, such a division must of necessity refer to the free whites only, as the other elements—numerically

inconsiderable, it is true, in New York—were not divided by sex.

The census of 1790 remained the model for subsequent enumerations down to the year 1840 inclusive, both as respects the form of schedule and of publication. Not that the census remained stationary, but the fundamental principle remained unchanged.

During this period the schedule underwent several extensions, and at each census it was larger than at the preceding, yet the line of variation was a very simple one, relating as it did chiefly to the age divisions of the population. In the enumeration a single line represented a family and in publication a single line represented a geographical unit, whether township, county, state or nation. In 1800, 1810 and 1820 the scheme of age distribution was practically the same for whites. It comprised for males and females separately the following groups:

Under 10, 10 to 15, 16 to 25, 26 to 44, 45 and upward.

Slaves and free colored were enumerated in the mass in the years 1800 and 1810, while in 1820 a sex and age distribution similar to the free whites was adopted. The latter census also had a column devoted to "all other free persons except Indians not taxed," a category which, it must be assumed, included civilized Indians, but which disappeared in subsequent enumerations. In the years 1800 and 1810, as in 1790, the aggregate population by the family or geographical unit was the sum of all the individual columns relating to it. For the first time in 1820 columns appeared which did not enter into this total. One of these was an anomalous age class of sixteen to eighteen years for males only, the purpose of which is not clearly discernible, and a category of foreigners not naturalized. In the published report a double ruling separates these columns from the adjacent ones, and the headings of the columns were printed in italics. Apart, therefore, from the question relating to

citizenship, the only extension of the tables up to 1820, inclusive, was in the direction of a more complete and more uniform age distribution for the different classes.

In 1830 and 1840 the schedule was considerably enlarged. The age distribution of free whites was in five-year classes up to nineteen years, inclusive, and in ten-year classes thereafter, with a final class of one hundred years and over, for each of the sexes separately. For slaves and free colored persons a more summary distribution with six classes in each sex was made, the age classes being as follows:

Under 10, 10 to 24, 24 to 36, 36 to 55, 55 to 100, 100 and over.

Thus only was the uniformity of the distribution disturbed, but an exact comparison between whites and blacks was rendered impossible. The lack of adherence to the decimal system in the length of the age periods here as well as in the grouping for free whites prior to 1830 is unaccountable.

The schedule showed an improvement, inasmuch as additional inquiries did not, as in 1820, appear in the midst of the schedule, but were reserved for the final columns, after a column had been provided for the total population. The additional information required in 1830 related to physical defects, deaf and dumb in three age groups, the blind in the aggregate for white and colored separately, and also to citizenship. In 1840 insanity was added to the physical defects recorded, while for the first time the census made a record of occupations, which, however, were summarized in seven groups. This census also asked for the number of pensioners. One column related further to illiteracy and a number of columns to schools, though how the latter could have been recorded in the general population schedule is not apparent. The following statement shows the development of the questions from 1790 to 1840:

NUMBER OF COLUMNS IN POPULATION SCHEDULES OF THE
CENSUS 1790-1840.

	Name of locality.	Name of heads of families.	FREE WHITES.		FREE COLORED.		SLAVES		Columns entering into Total.	Additional columns.
			M.	F.	M.	F.	M.	F.		
1790	...	1	2	1		1		1	5	...
1800	1	1	5	5		1		1	12	...
1810	1	1	5	5		1		1	12	...
1820	1	1	6*	5†	4		4		27	2
1830	1	1	13	13	6	6	6	6	50	9
1840	2	...	13	13	6	6	6	6	50	26

The schedules were set forth in the successive laws governing the census, and it was the duty of the marshal to fill them out through his assistants. On the completion of their labors a summary was made and sent to the Department of State. In the main the department contented itself with the preparation of one general table for the United States and the printing of the marshals' returns. In publication the census reports followed closely the original schedule, and the size of the pages increased from one census to another with the number of columns in the schedule. As late as 1820 the returns for the different states varied considerably. In that year Vermont made no return of the population by towns, while in several cases (Rhode Island, Connecticut, Delaware, Maryland and Massachusetts) the county totals are not added from the town returns, an omission which the State Department failed to rectify. These obvious irregularities led in 1830 to a publication of the returns of the marshals in two forms, first, as made, and then as corrected. The correction appears to have been to secure uniformity in the presentation, the county totals omitted by the marshals (Massachusetts, Maryland, Indiana and Michigan) being supplied. In 1840 the need of a

*An anomalous age column.

†A column "all other free persons."

proper editing seems to have been better understood, as there is a single publication of the returns as reported and corrected.

In this period there could be no tabulation of statistics in the modern sense of the word. It was quite impossible to do more than reproduce the schedule, since the facts were not so recorded as to be susceptible of combination. Thus in the 1840 schedule no relation could be ascertained between occupations on the one hand and sex, race and age on the other. In the published results the simplest grouping was not made, the principle being pursued that each line on the schedule or in the published table must count up to the total at the end. Hence such intermediate sums as the "total white," "total free colored," "total slaves," "total males" and "total females" were not given in the tables, and if needed must be laboriously calculated.

The development during this period was simply in the direction of greater detail, but the census was still very crude as compared with our modern enumerations. Nor had the machinery of taking the census during this period undergone any essential change. The first census enumerators were allowed by the law nine months for the completion of their labors, and this practically remained the rule until the year 1850.

In consequence of this increased size of the schedule, which was aggravated by the ineffectiveness of the enumeration machinery, the census results were looked upon with great distrust. The census of 1840 in particular was the object of much hostile criticism. With the increase of the number of columns the control of the correctness of the results became increasingly difficult. The marshals were not required to transmit the individual schedules to Washington, but simply the total results for geographical divisions. The labor of making these summaries was therefore entrusted to the various marshals and their assistants scattered through the country. With a complete absence of

administrative control it was natural that the census should contain many errors.

Among the evidences of discontent with the census which have been preserved is a memorial addressed in 1843 to Congress by the American Statistical Association through a committee consisting of Edward Jarvis, William Brigham and J. Wingate Thornton. The memorial contends that the census is so outrageously defective that it cannot be considered a true picture of the state of the country and should not receive the sanction of Congress. They point out that in many cases the reports are obviously incorrect. A special study is made in their memorial of the school statistics of New England. The facts recorded in the tables are not only inconsistent with one another, but are at variance with official data collected and published by the state administration. Of greater interest for our present purpose is the discussion of the statistics of physical and mental defects among the colored population. The committee printed a list of seventy-five towns in the northern part of the country, where the number of the colored deaf and dumb reported by the census is as great as or even greater than the total colored population. In a still larger number of towns, a list of which is given, the number of colored insane equals or exceeds the colored population. These flagrant instances are in the minds of the committee sufficient to throw a doubt upon the value of the whole work. From Thomas Earle and other citizens of Pennsylvania a memorial was received by the House in which attention is called to the same facts in more general terms. In commenting upon these memorials a Select Committee of the House * (Mr. Pratt, of New York, chairman) acknowledged that the facts are as stated, though they confessed their inability to discover where the error took place, whether in the original returns, in transcribing, or in publication. It should, however, be remarked

* H. R. Reports of Committees, First Session, 28th Congress, Vol. iii, Nos. 579 and 580.

that the evidence of the American Statistical Association is to the effect that many errors were to be found in all three operations. At the same session Congress was occupied with a project of creating a bureau of commerce and statistics in the Treasury Department. In the first committee report upon this measure its advantages are set forth by the chairman, Mr. Pratt, in very explicit terms. The bureau which was contemplated was to concern itself with such questions as were subsequently assigned to the bureau created in 1865. Neither in the first favorable report of March 8, 1844, on this project, nor in a subsequent one,* which was presented February 27, 1845, together with a strong letter of recommendation from the then Secretary of the Treasury, George M. Bibb, is the relation of the proposed bureau to the census work considered. Yet when on June 17, 1844, the same Select Committee of the House commented upon the memorials which have been mentioned, the report says that the defects of the census discussed in the memorials form a strong argument for the establishment of a bureau of statistics. They must therefore have contemplated at that time that this bureau should take charge of the census work, though they forgot this argument in February, 1845, when they made their second report. No action was taken at this Congress and the contemplated bureau was not finally established until 1865.

Second Period, 1850-1870.

In preparing for the census of 1850 Congress recognized the justice of the current criticisms of the previous census and entered seriously upon the work of reorganizing the census. An act of March 3, 1849, created a census board, composed of the Secretary of State, the Postmaster-General and the Attorney-General, and charged this board with the duty of drafting the forms and schedules which might

* H. R. Reports of Committees, First Session, 28th Congress, Vol. 1, No. 301; Second Session, 28th Congress, No. 110.

be necessary for the seventh census. Its exact functions were never distinctly defined and subsequent legislation rendered it ineffective. Congress had on the same day established the Department of the Interior and transferred the census labors from the State Department to the newly-created department. When Congress met in the fall it appointed a special committee upon the census which proceeded to prepare for the seventh census with little regard to the actions of the census board. Some doubt was expressed on the floor of the House whether such a board was competent to prescribe schedules without action by Congress. In any event it is sufficient to say that Congress took the matter in its own hands. The special committee, in consultation with some of the best authorities on statistical matters, prepared an elaborate bill. In their main features its recommendations met with the approval of Congress. The scope of the census work was indeed greatly enlarged, and the debate, which was prolonged, dealt at length not only with the expediency but also with the constitutionality of any enumeration beyond that of the people and for the purpose of apportionment. In the end the utility of statistical work overcame the constitutional scruples which were brought forward by Alexander Stephens, of Georgia, and other eminent southern members.

The Act of May 23, 1850, is a distinct advance upon the previous legislation. It was designed to provide for the seventh census and in the absence of subsequent legislation for any future census. In fact, the law governed the census down to 1870, inclusive. No change was made in the organ of enumeration, the marshals and their assistants fulfilling this duty as heretofore, under the supervision of a superintendent of the census in the Department of the Interior. The law provided not less than six schedules, two of which, one for free inhabitants and one for slaves, related to population. The schedule provided for the free inhabitants is in the form of a family schedule, with a distinct line for

each member of the family, who for the first time were recorded by name, but each sheet was used for as many persons as possible, several families being on the same sheet. The privacy of a family schedule was lacking, but the principle of individual enumeration was established. It will be remembered that in the previous census operations the schedule was for the locality, and each line represented a family, the head of the family only being designated by name. As the schedule for 1850 provided a line for each person the information requested as to age, sex, etc., could be recorded in a single column, and the schedule was therefore much simplified. The grouping of the facts into tables for publication was no longer left to the marshals of the various districts, but entrusted to the Census Office. The marshals had no further duty than to collect the schedules and send them to Washington, where they were to be tabulated in a central bureau, thus insuring a greater guaranty for formal accuracy and unity of effort than had existed before. The schedule for free inhabitants assumed practically the form with which we are familiar to-day, though it is more limited in scope than in the last census. In addition to the name of the free inhabitants questions are asked regarding age, sex, color and place of birth of all of the inhabitants. Further columns relate to profession for persons over fifteen years of age and illiteracy for persons over twenty years of age, physical or mental defects, ownership of real estate, marriage within the year or school attendance within the year. The schedule for slaves is simpler, and involves simply age, sex, color, physical or mental defects, and some few questions which could not apply to the free inhabitants.

With the census of 1850, therefore, we find an enumeration based on schedules akin to those now in use. The subsequent development of the census has involved no change in the form of the schedules. The advance which has since been made lies rather in the increase in the questions

asked and especially in the utilization of these questions in the tabulation. The census for 1850, which was conducted under the supervision of J. B. De Bow, showed a marked advance in the statistical spirit in its publications. For the first time in the history of the census we have an adequate introduction. This gives in the first place an account of the legislation under which the census was conducted, the instructions issued to the enumerators and some of the administrative details with regard to the mode of classification, etc. It is much to be regretted that the good example set by Mr. De Bow has not always been followed. The student of statistics needs in many cases the official interpretation of words and phrases which can only be found in these administrative documents. After a description of the census machinery the superintendent proceeds to an analysis of the census results. The analysis treats of population by topics and contains comparisons with the preceding census enumerations and in many cases also with foreign countries. The arrangement of the general tables in the body of the work is less commendable. It is purely geographical, all of the statistics of Maine, no matter to what subjects they relate, being given first, and the other states in order. If, for instance, we desire to find the illiterates by states we can refer to the introduction, but if we seek a table for illiteracy throughout the United States by counties we must turn to Table IX in each one of the states. This holds true, of course, of any other item of information.

The census of 1860 followed the same methods as that of 1850, being taken under the same law and with the same schedule. It came at a critical period of our history and did not receive much general consideration.

Before the census of 1870 was undertaken a careful consideration of the needs of the census took place in the House of Representatives. A committee presided over by General Garfield presented January 18, 1870, an elaborate report upon the census, with suggestions for important and radical

changes in the census methods. The committee prepared a valuable history of census methods in foreign countries and in the United States, and its report has been the chief source of information for those who have been curious to study the development of our statistical efforts. Together with their own report they published some account of the International Statistical Congress, which had then recently devoted much consideration to the subject of population statistics and a valuable paper by Dr. Jarvis, of Boston, on the needs of the census work.

In the field of population statistics the committee did not feel justified in recommending any substantial change as to the period of enumerations. The proposition for a one day census which had been made by Dr. Jarvis was rejected by them on account of the extreme difficulty which that method involves. The distinctive argument for the United States is the fact that our census schedules, owing to the census being "the only instrument of general statistics," were more elaborate than those of countries having permanent statistical bureaus. The committee, however, are agreed that the time allotted to the enumeration was too long and that a period of one month should be sufficient. The delay in publication of the census, which had given rise to vexatious complaints, and which as we know has not yet been abolished, is ascribed by them, in part, to the length of time allotted for enumeration purposes. In the light of the experience of 1880 and 1890, however, this has proved to be a minor element in the delay.

The committee urged, however, certain improvements in the schedule and added to the questions already asked those relating to relationship to head of the family, to conjugal condition, to parentage and to dwellings.

The most radical change which was proposed was in the machinery of the census, taking the enumeration out of the hands of the United States marshals and placing it under special agents. The old rule had worked ineffectively, not

only because the marshals being judicial officers were already sufficiently occupied with other and different functions, but also because of the inequality in size of the judicial districts, which had imposed upon some of the marshals inequality in their judicial district. A district of Massachusetts embracing a million and a quarter inhabitants is contrasted in the report, with one in Florida with a population of seventy thousand, and one in Alabama with a population of three hundred and twenty thousand.

The bill for the taking of the ninth census prepared by this committee involves the points above mentioned, together with many other details, which looked to a change in the machinery of census taking, to an improvement of census schedules and an enlargement of their scope. Unfortunately the labor which was spent in the preparation of this bill was for the time being lost. While it passed the House, it failed in the Senate, and it was not until 1880 that its essential provisions were incorporated in the law.

The ninth census was taken therefore under the Act of 1850 in default of any new legislation upon the subject. The Superintendent of the Census, General F. A. Walker, chafed under the old and antiquated machinery, and in his introductory remarks discussed the difficulties which he encountered with perfect freedom and with that vigor of language which marked all his utterances. All that careful tabulation could supply he gave. His tables are arranged by topics and his text commentary is an invaluable aid to the comprehension of the figures, and of the charts which form a distinctive feature of this census publication.

General Walker is even more explicit than the Garfield Committee in his discussion of census methods. In his introductory report he claims to have made the best census which could be made under the existing law. Complaints against the census were frequent. They were generally of a class, however, which have not yet disappeared, complaints that the population attributed to certain localities was too small.

The animus of such complaints is perhaps best portrayed in the words of the introduction which remarks that "the complaints in the great majority of cases have been not so much on account of the inadequate representation of the town or city itself as of the superiority attributed to some immediate rival." These contentions are dismissed by General Walker as without foundation. He is, however, emphatic in dealing with the "essential viciousness of a protracted enumeration." While the time allowed for taking the census had been somewhat shortened, it was none the less under the law of 1870 in round numbers one hundred days. Such a period offers wide opportunity for omissions and to some extent duplications in the census. General Walker is of the opinion that the census might readily be taken in a single day in the larger cities, in a period of three or four days in the manufacturing districts of the country and a period not exceeding one month in the outlying regions. This ideal has not yet been realized. While acknowledging with courtesy the services of the marshals who had assisted him in the work of the ninth census, he does not hesitate to call attention to the defects of the law in imposing this service upon those officials. Under the law they were charged not only with the supervision of the enumeration but also with the preliminary work of determining the sub-divisions within their district. Moreover, it was always an anomalous condition that the agents of the Department of Justice should for this purpose be under the direction of the Department of the Interior. Another question which has vexed the legislator since the first census was begun—namely, the mode of compensation for enumerators—receives attention at length from the superintendent, but its discussion hardly belongs within the scope of this paper.

The schedule of 1870 was improved by the recasting of the headings and the introduction of a summary question permitting a record of foreign parentage.

In the census work the greater exactness resulted from the distinct formulation of certain questions, notably that with regard to occupations. In the compilation of results greater care was exercised. The utilization of the materials was more complete than the former periods. Improvements are to be noted in reference to classification of ages and of occupation, in short, in the inter-relation of the different figures.

Third Period, 1880-1890.

A new period in our statistical history began with the census of 1880. The Act of March 3, 1879, provides for a census of broader scope than any which had heretofore existed. The recommendations of the Garfield Committee were substantially accepted in the formulation of the law. That which characterizes the census of 1880 over and above those which preceded it, is the enormous extension which was given to the supplementary work of the census beyond the enumeration of the people. As concerns the latter, with which we are here occupied, the most important innovation was the establishment of special organs for the collection of the material. The United States marshals were no longer charged with these duties, which were entrusted to specially appointed supervisors of the census. The result was greater uniformity in the labors of the supervisors through the greater equality of the districts over which they presided. There was another change from an administrative point of view, in that census enumerators were directly amenable to the Superintendent of the Census and the Secretary of the Interior, who was ultimately responsible for the operations of the Census Office. The improvement in the schedule was represented by the introduction of questions relating to the conjugal condition of the people and to parentage.

The published results of the census reflect the more generous spirit in which the appropriations have been made for this work. The tabular statements are superior to those

which preceded them in the wealth of their details and in the correlation of the different facts which were the subject of the census enumeration. As late as 1880, however, the methods of tabulation pursued in the Census Office were of a primitive character. They afforded many opportunities for errors, while their clumsiness prevented the fullest utilization of the facts which had been collected by the enumerators. Thus, the figures for conjugal condition are not tabulated at all in the census of 1880, while those for parentage are tabulated only in part. When one considers that the tables were made up by the primitive method of reading the schedules and scoring off the results by means of lines (like the scoring of points in a game) it will be marveled that so much was accomplished in the elaboration of the tables previously given, and it cannot be wondered that the office found its appropriations too limited for a tabulation of the additional items involved in the schedule.

With the eleventh census we reach a work so recent, that its general features are well known to students of economics. The promise of curtailing the census work, which was made at the outset, has only been partially fulfilled. The census of 1890 numbers twenty-five large volumes and exceeds in bulk that of 1880; but there has been a great gain through the elimination of non-statistical material which cut a prominent figure in the census of 1880. So far as the population is concerned, the schedules with which we are familiar were not essentially changed. The publication of the results, however, is far more ample than anything heretofore known, and is more extensive than the census work of any other nation. This result was made possible through the adoption in the work of tabulation of the electrical tabulating machine invented by Mr. Herman Hollerith. This has been a great boon to statistical work and promises to give us in the future, through the more perfect and complete analysis of results, a greater insight than we have heretofore enjoyed into the

phenomena of population. For not only has the United States census of 1890 demonstrated the efficiency of the machine, but also those of European countries where it has been adopted, notably Austria, have given us a far more complete analysis of the phenomena of population than we have enjoyed before.

The general trend of census development, which has been shown in the foregoing pages, is toward an improvement of census machinery, an elaboration of census schedules and a more careful and minute presentation of the results of statistical inquiry. It has been our purpose to bring these facts to the attention of the reader through a study of population, the original object of census research which still remains the incentive and backbone of the operation. But the history of the census is not complete without a consideration of the subsidiary inquiries which have grown out of the constitutional requirement of an enumeration of the population.

Subsidiary Inquiries.

As the census of 1890 devotes but two volumes of its twenty-five to the subject of population, it can readily be understood how subsidiary inquiries have grown in importance. Some of them are a direct outgrowth of the population schedule and represent as independent inquiries an elaboration of facts previously embodied in the population volume and even yet, in part, enumerated on the population schedule. Of this class there is the volume relating to the defective classes (the insane, the deaf and dumb and the blind). As early as 1830 the population schedule called for certain information with regard to these classes, and they have been the subject of inquiry at each succeeding census. The peculiar character of the schedules in vogue before 1850, however, made an elaboration of the data required out of the question. The mere fact of the existence of these infirmities, with such divisions as to color and age which

might be asked for on the schedule, was all that was available for publication. With the schedule of 1850 the returns are, as before noted, given individually, and statistics in relation to these classes are, therefore, capable of the same elaboration as those of the general population itself. None the less, the returns were very defective and the publication very meagre. It was not until 1880 that a more direct study of these classes was made. In that year, as well as in 1890, a special schedule was provided for these classes. It gave not only the general facts called for in the population schedule, but also a number of special inquiries which related to the cause and nature of the specific infirmities. In consequence of these changes a much more complete study of these unfortunate classes was possible. The statistics then in 1890, as compared with those for 1880, share in the general improvement of all population returns due to the introduction of improved methods of tabulation.

Similar to the foregoing are the statistics of crime, pauperism and benevolence. They date from the year 1850, when the population schedule contained a space in which might be recorded the fact of pauperism or criminality as well as physical defects. Unfortunately, no definition is given in the instruction of the words "pauper" and "convict," and the returns appear to have been quite incomplete. At any rate, such an elaboration of the returns as was possible was not undertaken and the census contents itself with recording simply the number of prisoners and paupers drawn not from the population schedule, but from that of social statistics. Somewhat more elaborate are the figures relative to 1870, though here again the tabulation was confined to facts drawn from the social schedule. The preparation of these schedules received greater attention from the central office, and every effort made to secure uniformity in the returns. A clear definition of the criminals is not given and we are informed in the introduction that the figures do not relate to inmates of houses of correction

or workhouses. Again, special schedules relating to these classes first appear in the year 1880, and for the first time we have a study of the special characteristics of the classes concerned. Prior to this date we have no information with respect to such important questions as the character of crime committed and the length of sentence for prisoners, or the causes of pauperism and the nature of the relief afforded to paupers. The tabulation for the year 1890, based upon similar special schedules, amplified in certain directions, is a remarkable analysis of the facts in question. No more complete study of population groups than that given in this volume exists anywhere to the writer's knowledge. In places, indeed, the figures are over-elaborated and tables constructed which serve no useful purpose; but this is a fault which will concern the legislator desirous of the economical use of public money rather than the student, unless such excessive and unnecessary work is at the cost of more important inquiries elsewhere.

Less obviously connected with the population schedule are the volumes relating to mortality and other vital statistics in the United States. They grow directly, however, from the population schedule and date from the year 1850, when the first attempt was made to collect vital statistics through the census agency. In that year a special schedule for deaths was introduced, and since then the attempt to collect vital statistics by this method has not been abandoned. The figures relating to births and marriages have been called for directly by the population schedule; those for deaths have of necessity been collected separately. The great interest which has always been felt in mortality statistics is doubtless the cause of the persistence of this schedule in the census. The statistics of mortality, to be instructive, must be complete. Those of the census are notoriously deficient. When, for instance, the census of 1890 gives as the death rate in the United States 13.9 per thousand of the population, the merest tyro in statistics

knows that the figure is incorrect. It represents the ratio of reported deaths to the population, and not the ratio of the whole number of deaths. In so far, therefore, as vital statistics depend upon quantitative measurements, these volumes must be characterized as worthless. Few inquiries in the census represent so large an amount of labor for so slight a positive result. It is not to be denied that these statistics give some indications of the prevalence of certain types of disease in certain regions, but that is all that can be said of them.

The next great field of census inquiry which we must consider is not directly connected with the enumeration of the population and is of independent origin. Of the census volumes which have not heretofore been noticed, the greater number can be included under the head of statistics of production. Of these the most important are those relating to agriculture, manufactures, mining and transportation.

The development of population statistics has shown us that the idea of utilizing the decennial enumeration of the people as a means of securing important information, was an early one. It was not, however, until 1810 that it was proposed to extend the census inquiries beyond the study of the population. The Act of May 1, 1810, declares that the marshals shall report upon all the establishments of manufacturing industries in their district. No schedule was prescribed for their guidance by the law and the matter seems to have been left entirely to the discretion of the Secretary of the Treasury; nor did that officer take the task seriously and attempt to produce a uniform schedule applicable to all branches of manufactures. He simply made a list of industries which were to be reported; he did not make it clear what was expected under each head. Some of his questions appear to look to the number of establishments, others to the amount of the product in bulk, and still others to the value of the product. As a consequence of such a heterogeneous schedule no summary figures could

be obtained in a form capable of comparison with the census figures of a later date. The mass of material collected was turned over to Mr. Tench Coxe, who with a free use of estimate and conjecture prepared in 1814 a "Statement of the Arts and Manufactures in the United States for 1810."

In 1820 another attempt was made to secure manufacturing statistics, and the schedule which was prepared by the Secretary of State, John Quincy Adams, is much superior to that of the previous census. It was as follows:

Raw Materials—Kind, Amount and Value.

Employes—Men, Women, Boys and Girls.

Machinery—Three questions.

Expenditures—Capital, Wages Contingent.

Nature of Product.

Value of Product.

Remarks.

In the absence of definite instructions it will be noticed that the schedule is somewhat vague and capable of varying interpretation in some of its parts. In other cases the questions are direct, and on the face of it should have given fairly satisfactory results. But the administration of a census office of those days was far from what it should have been, and so badly was the inquiry managed that the returns which were published were entirely unsatisfactory. Indeed, so great was the dissatisfaction with the results of these inquiries that in 1830 they were abandoned altogether. In 1840 the manufacturing schedule marks a certain improvement. It enumerates thirty-one different classes of manufacturing industry, grouping the remainder. Though the printed schedule is not specific, it appears that under each head three questions were asked—value of the product, number of persons employed, and the capital invested. Meagre as is the information asked for, the results could have been of some value had they been carried out consistently. But the three questions are not uniformly elaborated. A

summary in the preface to the tenth census report on manufactures shows that many items are omitted, so that totals for the United States or for any single state can not be obtained. This summary also shows sixteen special inquiries which were not provided with the general schedule and have little relation to it. It is clear that the complaints which this census gave rise to in relation to population, could have been made with equal force with regard to manufactures. Public opinion branded the entire census as worthless.

As in other inquiries we find the beginning of modern statistics with the census of 1850. The schedule of manufactures is substantially in the form which we use to-day and many comparisons may be taken back to that date. It is essentially an individual schedule, each establishment recorded being given a distinct line. The schedule contains fourteen columns, of which five describing the establishment, raw material, the product and motive force are not statistical in character. The remaining columns provided for numerical statement of the value of capital, the amount and value of raw material, the hands employed (male and female), the average monthly wages (male and female), and the amount and value of the product. The statistics of industry upon such a basis must necessarily be comparatively simple. It is obvious that only two principles of classification are practicable: a classification by localities, and a classification by industries.

No further development in manufacturing statistics took place until the year 1880. In that year the schedule was improved, especially as regards the census of the statement of wages. The question asked in this census is as to the total amount of wages paid and not the average wage. It is obvious this question can be answered more readily and more correctly than the previous one. Yet the greatest improvement which marks the census of 1880 was in the administrative machinery. The census act permitted the superintendent to withdraw the schedules of industry from

the hands of the ordinary enumerators and place them in the care of special agents, and wherever there was a great concentration of industry, as in the case of cities, this was done. Wherever, therefore, industry was on a larger scale, the facts were collected by more highly qualified agents. In the more distinctively rural districts they remained in the hands of the enumerators of the population.

Another improvement was the employment of experts upon special topics. Their reports comprised about one-half of the bulky volume on manufactures of the tenth census. Some of them are statistical, as in the case of Mr. Hollerith's report on the power used in manufacturing, while others are largely historical and descriptive, as in Mr. Wright's report on the factory system. Three volumes of the tenth census are devoted to the subject of manufactures and allied topics, namely: Volume II, Manufactures; Volume XX, Wages; Volume XXII, Power and Machinery Employed in Manufactures. The wages inquiry did not result directly from the schedule of manufactures, but was a special undertaking comprising a vast mass of information printed in bulk without classification.

In the eleventh census manufactures again occupied three volumes, which show an improvement in the schedule and in the administrative features. A much larger proportion of the work was collected by special agents than heretofore, while in the general schedule we find an itemization of the facts relating to capital, employes, and wages, which should be in the direction of greater accuracy. In the published volume we have a remarkably full and complete analysis of the returns.

In the other statistics of production, transportation is most closely allied to manufactures in the thoroughness of the inquiry and in the analysis of the results. This inquiry is a comparatively new one and found no place in the census before the year 1880.

Agriculture first appears as a topic for census inquiry in the census of 1840. The defective schedules of that census asked a few questions as to the value of the principal crops, but nothing further. In 1850 we have a separate schedule devoted to agriculture, embodying inquiries with relation to the size and value of farms, and the product of the more familiar crops. In the nature of things these schedules must have been filled out by the same enumerators as are occupied on the population schedules, and experience has shown that too great an elaboration of the questions defeats the purposes of the inquiry. There has been, therefore, no substantial change since the schedules of 1850. Questions appear from time to time as public interest suggests the desirability and disappear as experience proves the impracticability of securing adequate information upon these points. General returns from agriculture by the census methods are, therefore, of necessity, limited to a few topics. The change which has come over the census reports on agriculture relates rather to the utilization of the results obtained than to an enlargement of the field of inquiry. In 1880 we find for the first time the introduction of monographs and a separate treatment of the leading crops. As compared with manufactures, the available material is scantier and the analysis is less complete.

Mineral production was an object of census inquiry in 1840, but disappeared from the lists until 1880. In the year 1880 we have a volume on mineral production and also one on mining laws. The latter is omitted in 1890. The figures for mineral production in the census have been collected by special agents and lack co-ordination with the other forms of census inquiry. The published reports are mainly historical and descriptive, and while they afford a valuable monographic treatment of the different mineral products, do not enter into the general scheme of the census work.

Thus far we have traced the statistics of population and

the statistics of production. It would be impossible to mention in detail all of the topics which have been subjects of inquiry at the census. Suffice it to say that in addition to the topics already mentioned, the eleventh census contains volumes relating to churches, to wealth, debt and taxation, to insurance, to Alaska, Indians, mortgages, farm and home proprietorship, and indebtedness. It is not necessary to recount the stages by which these inquiries have been added to the census. It is enough to note the fact that they were included in it.

The utilization of the census as a means of securing statistical information has progressed to a point which makes it a most gigantic undertaking. To those who believe that the census should be confined to its constitutional object—the ascertainment of the population—all of these inquiries are obviously superfluous. While in times past such a narrow view has frequently been expressed by men eminent in the councils of the nation, it has not been heard so frequently of late. The utility of census work may be deemed definitely established. Current criticism of the magnitude of census operations is based on the duplication of labor by the census of work carried on by other organs of the government, and again on the administrative and technical difficulties which surround so huge an undertaking. It is not probable that a census will again be undertaken of the size of the eleventh or of the tenth. It is felt that the expansion of the census work has been at the cost of accuracy and effectiveness, and that it has been a primary cause of the delay in the publication of census results which has been so frequently criticised. Measures now under consideration look to a redistribution of census inquiries, so that the concentration of the numerous inquiries in a single year may be avoided. It is to be sincerely hoped that these plans will not lead to the omission of anything which is really valuable in the census work, as this would obviously be a step backward. A critical estimation of what is good and

what is bad, what indispensable and what superfluous, would lead far beyond the limits of this paper. Such an exhaustive criticism is much needed, but must be a co-operative work, since it may well be doubted whether any statistician of repute has the omniscience essential to such a labor or the temerity to undertake it.

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